The Health Literacy Status and Influencing Factors of Older Population in Xinjiang

Yongbing LIU [1], Yanru WANG [1], Fang LIANG [1], Yanli CHEN [1], Liu LIU [1], Yanfei LI [1], *Hua YAO [2], Qingquan CHU [3]

1. Dept. of Clinical Nursing, School of Nursing, Xinjiang Medical University, Xinjiang China
2. First Affiliated Hospital of Xinjiang Medical University, Xinjiang China
3. Social Welfare and Social Affairs Office, Urumchi Civil Affairs Bureau, Xinjiang China

Corresponding Author: Email: bingbing19950806@163.com

Abstract

Background: This study was to investigate the health literacy and influencing factors of older population in pension institution of Xinjiang, China.

Methods: Elderly people were selected from 44 pension institutions in Urumqi, Changji, Karamay and Shihezi and from September 2011 to June 2012 using random layer sampling method. The investigation was carried out by Chinese citizen health literacy questionnaire prepared by the China Health Education Center. Data were analyzed by One-way ANOVA, multiple linear regression and Pearson correlation analysis.

Results: A total of 1396 elderly people met the inclusion criteria and their average age was (77.37 ± 8.48) years. Their average health literacy score was (77.37 ± 8.48) points, which was at a low level. There was significant difference in health literacy score among the factors of age, gender, race, education, household income, marital status and occupation ($P<0.05$). The independent influencing factors of health literacy were education, race, occupation, household income, age and marital status ($P < 0.05$). Correlation analysis was conducted between the scores of health knowledge, health belief, health behavior, health skill and total scores of health literacy. Health knowledge scores and total scores had highest correlation ($r=0.95$), followed by health belief scores and total scores ($r=0.81$).

Conclusion: The correlation between health behavior scores and health skill scores was the lowest ($r=0.33$). The major factors that lead to low health literacy in elderly people are femininity, minority and low levels of education.

Keywords: Health literacy, Pension institution, Status, Influencing factors

Introduction

Chinese elderly population increases with an average annual growth rate of approximately 3.37% (1). It is estimated that by 2025, the elderly population with age $\geq$ 60 will account for 24% of the total population (2). Xinjiang turned into an aging society in 2010. Towards the end of 2011, Xinjiang elderly population with age $\geq$ 60 reached 2.3354 million, which was 10.80% of the total population. This elderly population in Xinjiang is growing with the average annual growth rate of 4.36% (3, 4).

From 2003 to 2008, the prevalence rate of chronic diseases among 65 years or older population rose significantly from 53.9% to 64.5% (4). The elderly need to take more charge of their own health management. It is a trend of social development in China for elderly people to live their lives in pension institutions (5). Therefore, with the increasing development space and greater demand for pension institutions, problems about health care for the elderly will become increasingly prominent. In order to maintain health, achieve healthy

aging and improve life quality of the elderly, social attention should be paid to the health condition and health care needs of elder population in pension institutions. In addition, health promotion of the elderly should be combined with chronic disease prevention (6). The improvement in health literacy should also be regarded as an important indicator of the result of health education and promotion.

Surveys show that low health literacy is a widespread phenomenon. A national survey in U.S. in 2003 showed that low health literacy was very severe. About 14% of adults lacked basic health literacy skills, and 20% only had basic health literacy skills. The health literacy of Hispanic people and black people was lower, which were 57% and 58%, separately (7). The proportion of low health literacy population in U.S. was between 34% and 59% (8). About 1/3 of teenagers and adolescents had low health literacy level (9). In Australia, 24% of the respondents had limited health literacy, and 21% might lack health literacy (10). In Canada, 60% of adults lacked necessary health literacy skills. Elderly with 65 years of age or older had the lowest health literacy (11). Health literacy skills began to decline rapidly from 55 years of age (7).

Currently, studies on the elderly health literacy are rare. Health literacy is a relatively new concept and field which just began to develop in the past decade (12). The correlation between health literacy and health outcomes are being investigated (13). The potential role of health literacy skills in promoting health condition and health care of the elderly people still needs further investigation (14). Moreover, the lack of research in health promoting strategy, especially in terms of skills intervention studies may restrict health literacy interventions (15).

In this study, elderly people from 4 places of Urumqi, Changji, Karamay and Shihezi in Xinjiang were included. The status of health literacy of elderly people in pension institutions and its influencing factors was investigated. The correlation between health literacy and its influencing factors was also analyzed. Our findings provide basic information for health literacy interventions and improving health conditions of the elderly in the future.

Materials and Methods

Sampling principles

Subjects enrolled in this study were selected based on the following criteria. 1) The random layer sampling method was used for sampling. The information about 44 pension institutions and more than 4500 elderly people in Urumqi, Changji, Karamay and Shihezi from September 2011 to June 2012 was collected. The information was obtained by asking questions by investigators. 2) Inclusion criteria: a. Age $\geq$ 60; b. Clear consciousness, ability to read or communicate, and accessibility to investigators; c. The respondents would like to cooperate with the investigators after the purpose of the research was explained. 3) Exclusion criteria: mental disorders, cognitive disorders, severe and end-stage diseases. A total of 1452 respondents met the criteria above and their information was obtained through face-to-face inquiry by investigators. A total of 1452 questionnaires were issued and the valid response rate was 96.14% (1396 of 1452).

Prior written and informed consent were obtained from every patient and the study was approved by the Ethics Review Board of Xinjiang Medical University.

Chinese citizen health literacy survey

The Chinese citizen health literacy survey questionnaire was used (16). The Chinese citizen health literacy survey questionnaire was a standard questionnaire in China and was developed by the China Health Education Center. The questionnaire included four dimensions of health belief, health knowledge, health behavior and health skill literacy, with 98 entries and a total of 196 points. The Cronbach α coefficient for the four dimensions of health belief, health knowledge, health behavior and health skill literacy was 0.894, 0.752, 0.741and 0.767, respectively. These coefficients indicate that this questionnaire can well reflect the major health problems in China.

Scale of the general status

The scale was made by measuring social demographic characteristics (including name, age, gen-

der, race, education, household income, family size, marital status, occupation, etc.).

Scoring criteria

Among the 98 entries in the questionnaire, the lowest score was 0 point and the highest score was 2 points. All entries were equally weighted. For questions about health belief, wrong answer was scored 0 point, neutrality was scored 1 point and right answer was scored 2 points. The answers of "do not know" were regarded as wrong answers and were scored 0 point. For questions about health knowledge, health behavior and health skill, wrong answer was scored 0 point and right answer was scored 2 points. The answers of "do not know" were regarded as wrong answers and were scored 0 point. According to the scoring criteria, the scores of belief literacy, knowledge literacy, behavior literacy and skill literacy were calculated. The total score of health literacy was calculated by adding the scores of the four dimensions with equal weighting. A higher score indicated higher level of health literacy (16).

Statistical analysis

A database was established using EXCEL2000. Double-entry and validation was conducted. SPSS 15.0 (Chicago, IL, USA) was used for data analysis.

Measurement data were presented as $\bar{x} \pm s$. Enumeration data were expressed as rate or constituent ratio. T test was used for comparing differences between two groups. One-Way ANOVA was used for comparing differences among multiple groups. Pearson correlation analysis was performed to investigate the correlation of continuous variables. The equation of elderly health literacy was established using multiple linear regression model ($a_{in}=0.05$, $a_{out}= 0.10$). $P< 0.05$ was considered as statistically significant.

Results

The relationship between elderly health literacy levels and social demographic characteristics

To determine the health literacy status of elderly people, the influences of social demographic char-

acteristics to elderly health literacy levels were analyzed. The social demographic characteristics and the health literacy scores of the elderly people were shown in Table 1. The elderly people in this study were aged from 60 to 99 years old, with an average age of (77.37 ± 8.48) years old. The percentage of elderly people aged from 75 to 84 years old was 51.86%. There were 619 males and 777 females, accounting for 44.34% and 55.66%, respectively. The majority of elderly people were Han population, with a ratio of 94.2%. The education level was mostly primary school or below, and elderly people with this education level accounted for 61.53%. The majority of elderly people had a household income of 2000-5000 yuan/month, which accounted for 45.85%. The percentage of elderly people with family size of 3 to 5 persons was 51.36%, which was higher than other family sizes. Among marital status, widowed population accounted for 70.56%. As for occupation, elderly people with farmer as former occupation accounted for 34.96%.

One-Way ANOVA was conducted to compare the differences among the factors of age, gender, race, education level, household income, family size, marital status and former occupation. There were significant differences in health literacy score among the factors of age, gender, race, education level, household income, marital conditions and former occupation ($P< 0.05$) (Table 1).

Analysis of health literacy influencing factors with multiple linear regression analysis

To determine the influencing factors for health literacy, multiple linear regression analysis was performed in elderly people. As shown in Table 2, elderly people with higher level of former occupation tended to have higher literacy scores. Compared to elderly people with farmer as former occupation, elderly people with manager, professional and production staff as former occupation had significant higher level of health literacy. There were significant differences between married and unmarried elderly people. Thus, the independent influencing factors for health literacy were education level, race, former occupation, household income, age, marital status (Table 2).

Table 1: Correlation between health literacy level and social demographic characteristics in 1396 of elderly people

Social demographic characteristics	Percentage (%)	Health literacy score (x ± s)	F/t value	P value
Age (yr)			6.457[a]	0.001
< 65	102 (7.31)	74.13 ± 27.10		
65-74	311 (22.28)	76.21 ± 28.71		
75-84	724 (51.86)	71.53 ± 27.97		
≥ 85	259 (18.55)	65.99 ± 28.58		
Gender			3.522[b]	0.001
Male	619 (44.34)	74.72 ± 28.80		
Female	777 (55.66)	69.36 ± 27.78		
Race			4.125[b]	0.001
Han	1315 (94.20)	72.51 ± 27.81		
Minority	81 (5.80)	59.20 ± 33.77		
Education level			67.907[a]	0.001
Primary school or below	859 (61.53)	64.05 ± 24.67		
Junior high school	220 (15.76)	79.24 ± 28.91		
Senior high school and technical second-ary school	193 (13.83)	84.98 ± 26.95		
Graduate and above	124 (8.88)	91.04 ± 32.93		
Household income (Yuan/month)			9.982[a]	0.001
< 500	62 (4.44)	57.52 ± 27.53		
500-1000	76 (5.44)	66.11 ± 26.44		
1000-2000	474 (33.95)	68.54 ± 28.73		
2000-5000	640 (45.85)	74.74 ± 27.22		
≥ 5000	144 (10.32)	78.04 ± 29.85		
Family size (Person)			0.647[a]	0.524
1-2	266 (19.05)	73.49 ± 31.47		
3-5	717 (51.36)	71.45 ± 27.49		
≥6	413 (29.58)	71.10 ± 27.73		
Marriage status			6.904[a]	0.001
Unmarried	38 (2.72)	71.50 ± 28.88		
Married	327 (23.42)	76.73 ± 29.22		
Widowed	985 (70.56)	69.65 ± 27.82		
Divorced	46 (3.30)	81.07 ± 27.64		
Former Occupation			32.609[a]	0.001
Manager	218 (15.62)	86.30 ± 31.71		
Ordinary staff	121 (8.67)	67.97 ± 29.63		
Professionals	237 (16.98)	80.86 ± 26.03		
Service industry employee	101 (7.23)	66.97 ± 30.62		
Production staff	231 (16.55)	73.44 ± 28.08		
Farmers	488 (34.96)	61.92 ± 22.43		

Note: [a] represented for *F* value; [b] represented for *t* value.

Table 2: Multiple linear regression analysis about the influencing factors of elderly health literacy

Variables	Partial regression co-efficient	SE	Standardized partial regression coefficient	t	P
Education level	7.909	0.764	0.282	10.354	0.000
Race	-15.656	3.037	-0.127	-5.156	0.000
Manager	14.034	2.108	0.182	6.657	0.000
Professionals	9.587	1.995	0.128	4.805	0.000
Production stuff	7.724	1.929	0.102	4.004	0.000
Household income	2.726	0.762	0.088	3.576	0.000
Age	-0.297	0.083	-0.090	-3.569	0.000
Single	-10.805	4.328	-0.061	-2.497	0.013

Correlation analysis for health literacy score

The correlation analysis was conducted between total scores of health literacy and scores of health knowledge, health belief, health behavior and health skill, respectively. The Pearson correlation coefficients were calculated. As shown in Table 3, health knowledge scores had the highest correlation with total scores (r = 0.95), then health belief scores with total scores (r = 0.81), followed by health skill scores with total scores (r = 0.72). The lowest correlation was found between health behavior scores and health skill scores, with r = 0.33. This result indicates that different dimensions of health literacy are closely related.

Table 3: Pearson correlation coefficient of health literacy score

Item	Total score of health literacy	Health knowledge	Health belief	Health behavior	Health skill
Total score of health literacy	1.00				
Health knowledge	0.95**	1.00			
Health belief	0.81**	0.67**	1.00		
Health behavior	0.55**	0.38**	0.45**	1.00	
Health skill	0.72**	0.60**	0.46**	0.33**	1.00

Note: All numbers in the table represent the r value. **, $P < 0.01$.

Discussion

In this study, in the elderly with age ≥ 65, health literacy level declined as age increased. The lowest health literacy level appeared in the elderly with age > 85. This study showed that health literacy level of males was higher than that of females, which was consistent with the result of Hu et al. (18). The different roles undertaken by men and women in the society; result in differences in the resources and opportunities gotten by men and women. Thus, due to the unequal gender and other social or economic factors, there was an unequal and unfair situation between men and women in disease susceptibility, health condition, accessibility to preventive action and health services, disease burden and treatment quality (19). The aspects above cause differences in health literacy between men and women. Men have an obvious advantage over women.

As for races, the Han had significant higher health literacy levels than the minorities ($P < 0.05$). To some extent, ethnic culture and language barriers limit the usage of health care resources by the elderly of the minorities, thus affecting their health literacy levels.

Education level is the one of the most important positive factors of health literacy. The elderly with high education level are more likely to seek for health knowledge and health care. They can obtain health information that is beneficial to their health from numerous information. In addition, they are able to communicate effectively with healthcare workers. Consistently, in the present study, health literacy level of elderly people was improved as education level increased.

Our study showed that the divorced elderly had higher health literacy score than the unmarried and widowed elderly. Elderly Chinese with 60 years of age or older have low divorce rate. There were only 46 divorced elderly in our study with an average age of 66.26 ± 11.05 years. Their age range was relatively low and the elderly at this age rage tended to have a relatively high health literacy range. Therefore, the divorced elderly had the highest health literacy scores in this study. The 38 of unmarried elderly people had low health literacy level. On one hand, it was due to less number in this group. On the other hand, living alone caused loneliness and less attention to their health condition. The percentage of widowed elderly was largest with a ratio of 70.56%.

This study has some limitations. For example, the subjects enrolled were from pension institutions in Xinjiang. The elderly people who did not live in pension institutions were not enrolled. Thus, the health literacy of these people is not clear. Moreover, the health literacy of the elderly people in China is not known either. Further studies are needed to investigate the health literacy of the elderly people in a much wider population.

Conclusion

Total score of health literacy was correlated to the score of four dimensions: health knowledge, health belief, health skill and health behavior. Among the four dimensions, health knowledge scores had the highest correlation with total scores, followed by health belief scores with total scores. The correlation between health behavior scores and health skill scores was the lowest. Our results further confirm that development and formation of healthy behaviors require a behavior changing pattern which is based on development of popularized health knowledge and health belief, and supported by mastered skills (20). Our findings may be useful for improving the level of health literacy and promoting healthy aging.

Ethical considerations

Ethical issues (Including plagiarism, informed consent, misconduct, data fabrication and/or falsification, double publication and/or submission, redundancy, etc.) have been completely observed by the authors.

Acknowledgments

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